

Smarter Community Energy Innovation

12:30-17:30, 18 October 2017

Yr Hen Lyfrgell/The old library, Cardiff, CF10 1BH

Agenda

This event will examine the rapid transition to a smart, decentralised and flexible energy system. We'll explore the opportunities for community energy groups to innovate and play a leading role, engaging communities and developing new business models for local supply and storage, and ensuring the energy revolution is low-carbon and democratic. It's about learning, collaborating, finding solutions and getting inspired.

12:30 Registration, lunch and networking

13:30 Welcome and introductions from chair

Rob Proctor, Community Energy Wales

14:00 Energy generation in Wales - progress and possibilities

An in depth look at the Welsh governments *Energy Generation in Wales* report produced by Regen. Find out where our energy comes from, which local authorities are leading the way in the clean energy revolution, who owns the generation, and who gets the benefit.

TBC, Welsh Government

14:30 Energy network innovation for communities

Our changing electricity network and the transformation from DNO to DSO means there are opportunities for community groups to innovate and build new partnerships, find out how you can engage in our new smart and flexible energy system and work with WPD to balance supply and demand, and connect more low carbon generation to the network.

Steven Gough, Innovation and Low Carbon Networks Engineer, Western Power Distribution

Q&A

15:15 Refreshment break and networking

15:45 Local supply and storage

National insight on the art of the possible and a detailed look at new business models for storage and local supply, that community energy groups are testing now.

Jodie Giles, senior project manager, Regen

16:15 Stories from the front line – community energy groups will share stories about innovative project they are doing, lessons learned and tips for others.

Silas Jones, Smarter Energy Project Manager, Cadwyn Clwyd will talk about their Smarter Energy project which aims to support 10 projects in Wales to find new energy business models that benefit the community.

Daniel Blackburn, Cwm Arian Renewable Energy, will discuss CARE's aspirations for a wind turbine, a microgrid/private wire *to one of Wales's largest haulage companies*, plus their plans for an electrolyser to generate hydrogen for the trucks, and a couple of community minibuses to boot.

Zoe Banks Gross from Easton Energy Group will share her experience of Two Streets of Solar, a community microgrid and local supply project in Bristol which could see solar installed on the two streets, a physical microgrid retrofitted, and the energy shared with neighbours who don't have PV on their roofs.

Q&A

17:00 Networking drinks

17:30 Close

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Energy Network Innovation for Communities

Steven Gough

Innovation and Low Carbon Networks Engineer

18th of October 2017

Smarter Community Energy Innovation

Yr Hen Lyfrgell/The old library, Cardiff, CF10 1BH

Outline

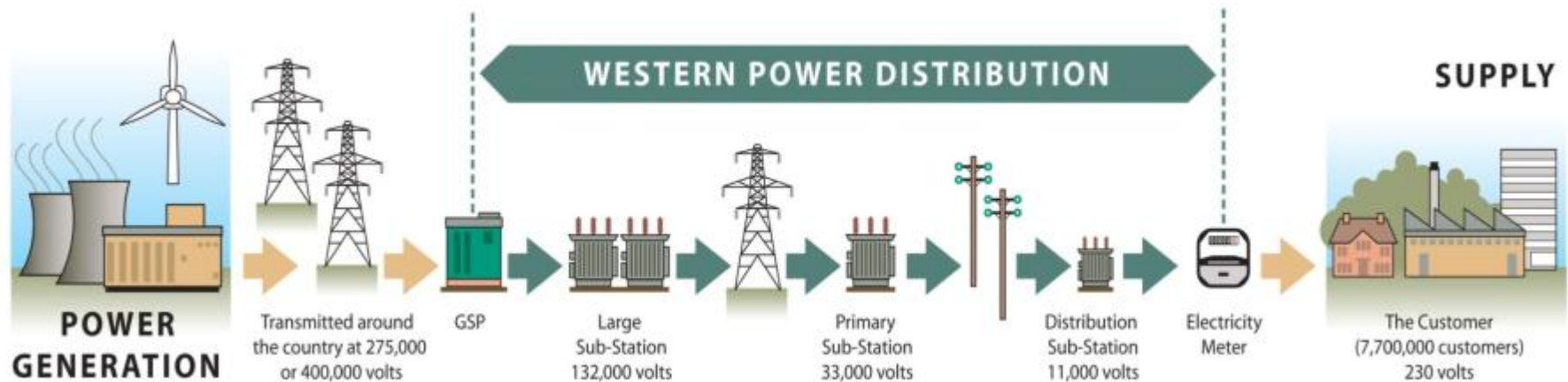
- Western Power Distribution – Who we are
- Traditional role of Distribution Network Operators
- Future role of DNO – Drivers for change and the challenges
- WPD's Innovation Strategy
- Innovation for communities projects
- Support for Community Energy

Our service territory and customer base

- WPD is a Distribution Network Operator (DNO)
- We distribute electricity to 7.8 million customers
- We operate 4 of 14 distribution licence areas in the UK



Traditional Role of the DNO



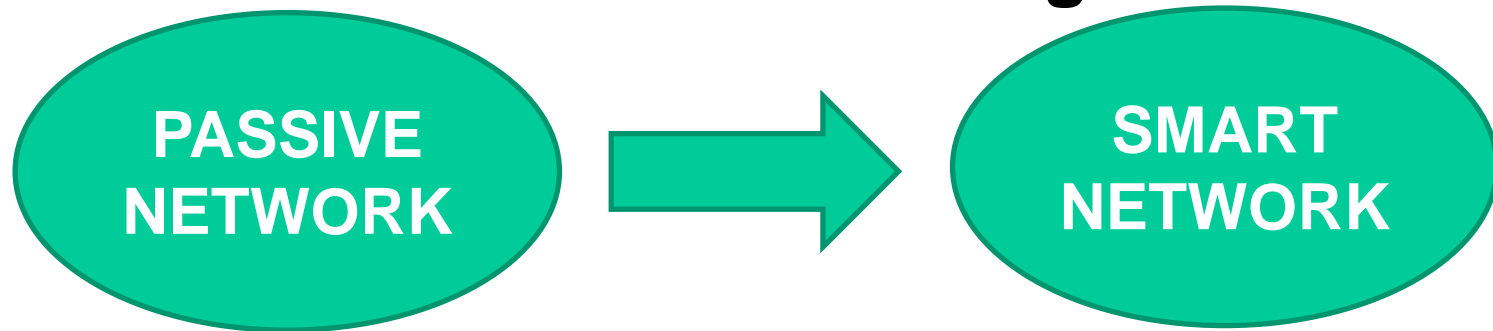
Key Activities

- Maintain the network
- Connect new customers
- Fix the network

Network Changes - Drivers

- Climate change and international agreements on reducing carbon emissions
- EU and UK binding targets
- Rapid changes in GB generation
- Significant uncertainty over the pace of change
- Long lead time to build conventional capacity

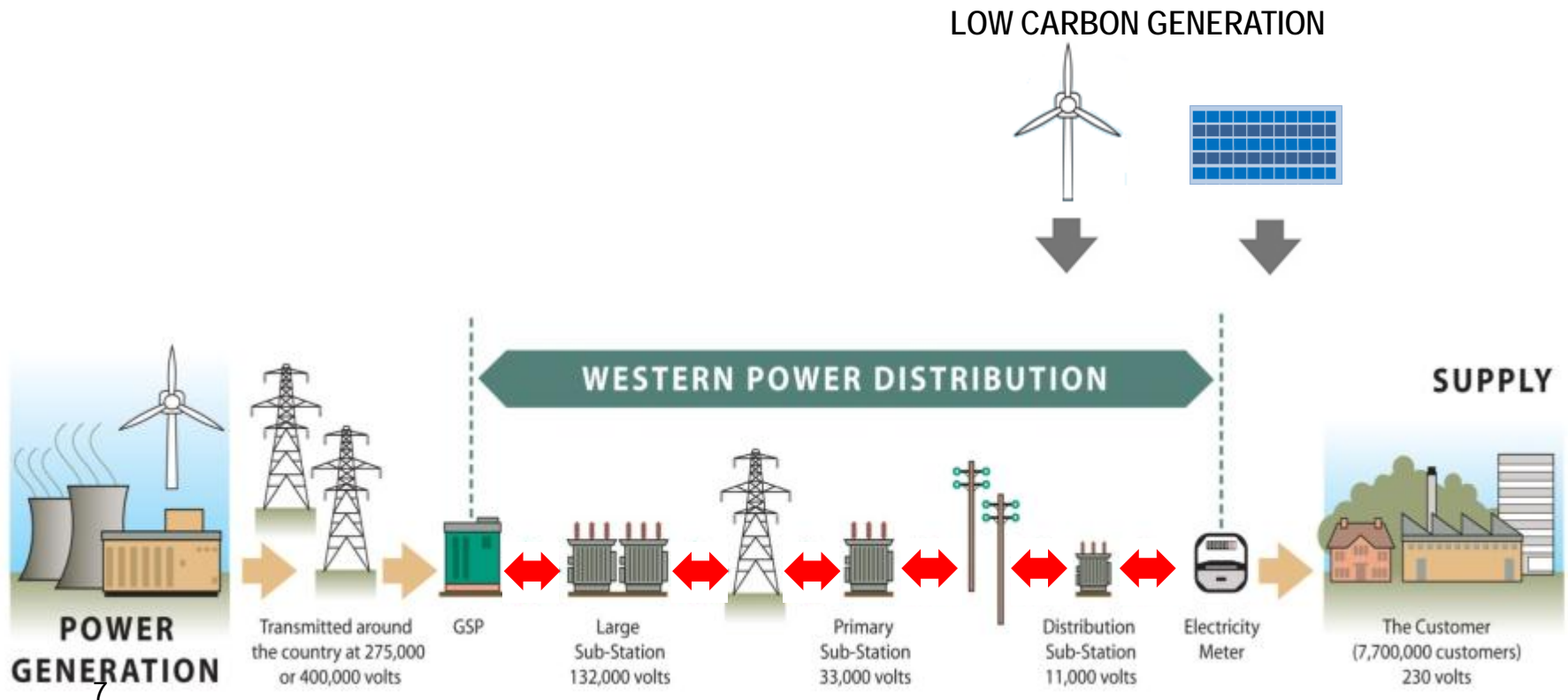
What needs to change?



- Historic and real time energy flows
- Forecasting future energy volumes across the network
- Active reconfiguring of the system as needed
- Commercial arrangements to contract DG, active demand and storage services
- National Grid Transmission System Operator (TSO) and DSO cooperation to reduce conflicts
- Simple platform for energy suppliers, generators/ storage, local community schemes and other market participants to trade in energy services

The challenge for our network

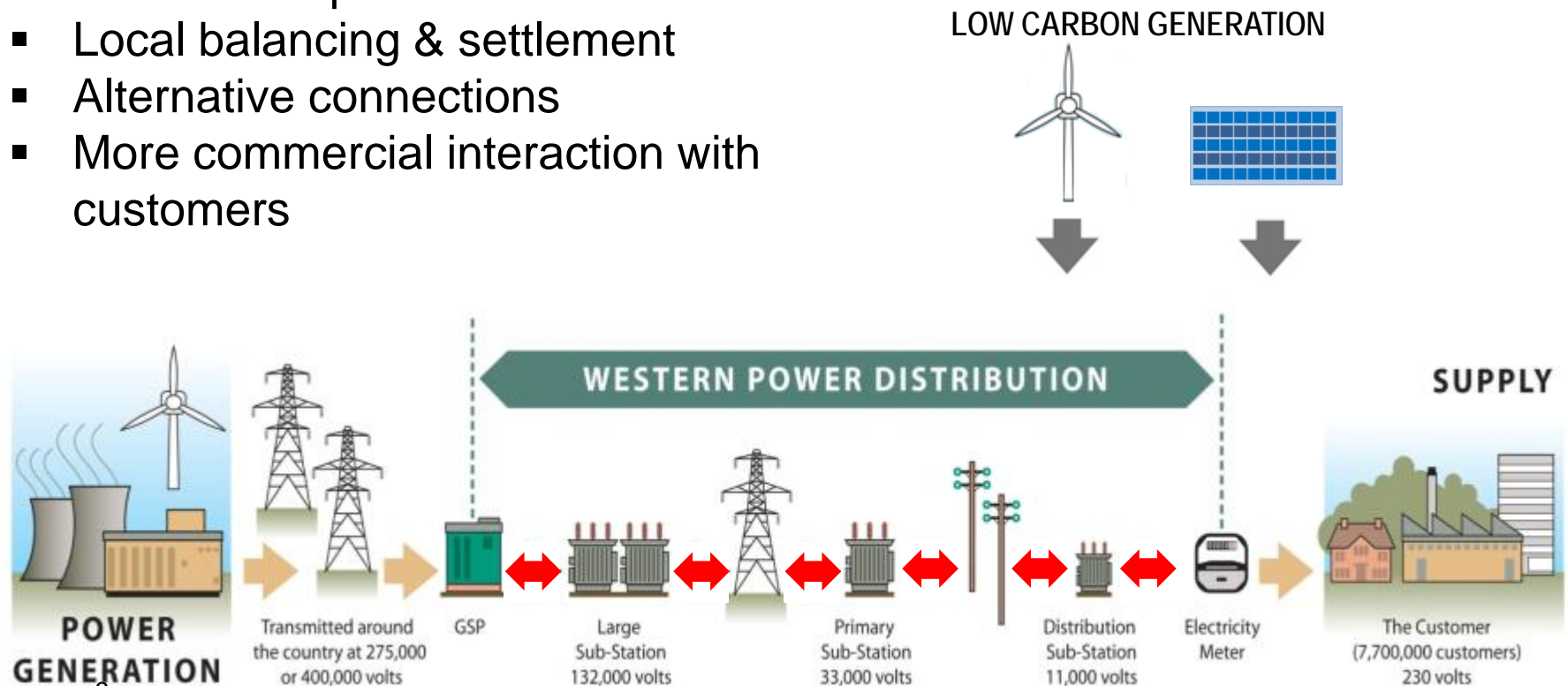
- Localised generation causes reverse power flows, voltage level changes, rapid variations in export / import
- Additional impact upstream on National Grid



The future role of the DNO

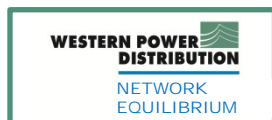
Key Activities

- Managing energy not power
- Demand response contracts
- Local balancing & settlement
- Alternative connections
- More commercial interaction with customers





NEW



Future Networks Programme

Assets

- Telemetry
- Decision support
- Improved assets
- New assets
- Flexibility
- Automation
- Incident response



Customers

- New connections
- Upgrades
- Information
- Self Serve
- Products/Service
- Tariffs
- Communities



Operations

- Reliability
- Forecasting
- DSO
- DSR
- GBSO Interface
- Efficiency
- SHE and Security



Network and Customer Data

- Airborne Inspections
- AIRSTART1
- Telecoms Analysis
- Superconducting Cable
- SF6 Alternatives
- MVDC Test Lab
- Smart Energy Laboratory
- Statistical Ratings
- Primary Network Power Quality Analysis

- Hybrid Heat Pump Demonstration
- Hydrogen Heat & Fleet
- Carbon Tracing
- HV Voltage Control
- Solar Storage
- LV Connect and Manage
- Sunshine Tariff
- CarConnect
- Industrial & Commercial Storage

- DSO/SO Shared Services
- Project SYNC
- Project ENTIRE
- Smart Meter data for Network Operations
- Distribution Operability Framework
- Times Series Data Quality
- Voltage Reduction Analysis
- LV Connectivity
- Smart Systems and Heat²

Note: 1 – Funded by Aerospace Technology Institution; Note 2 – Funded by the Energy Systems Catapult

WPD Innovation Project Learning

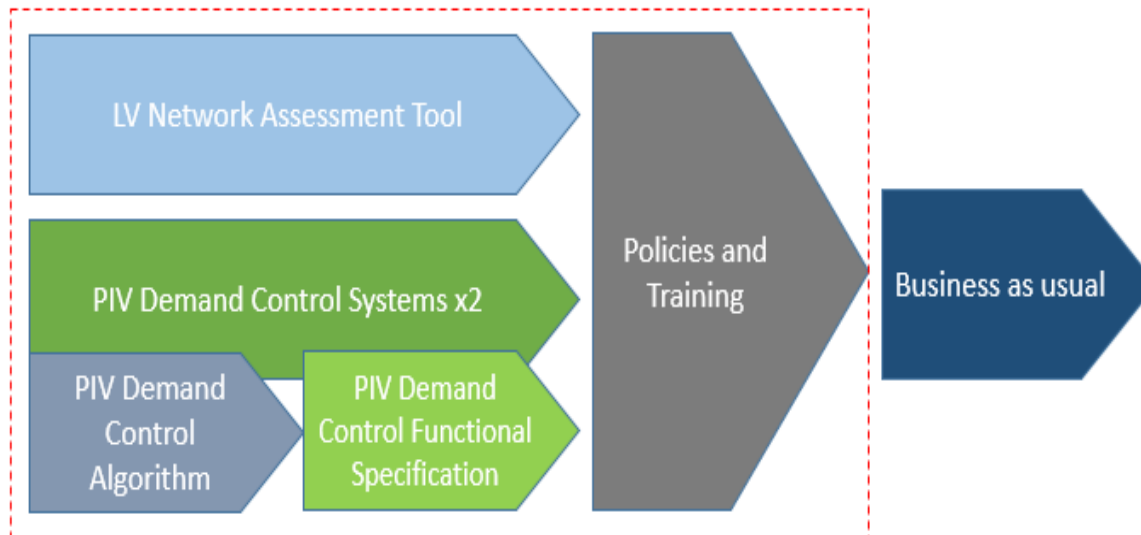
- LV Templates – Energy profiling
- Low Carbon Hub – development of Alternative Connections/ ANM
- Low Carbon Hub – development of DG constraint panels
- FALCON – I&C DSR (with DG and Active Demand)
- FALCON – Energy Forecasting
- SoLa BRISTOL – domestic DSR and DSM (with batteries)
- Community Energy Action – Community based DSR
- ECHO – domestic DSR (smart plugs)
- Car Connect – Smart EV charging
- SYNC – I&C DSR (demand shifting to summer DG peak)
- ENTIRE – Demand side response
- Solar Storage (DG output smoothing and ancillary services using battery storage)
- Plugs and Sockets – EU funded project



WPD Innovation for Communities

Electric Nation - CarConnect

- World's largest Plug-in Vehicle trial consisting of 500-700 vehicles
- Using a wide range of EV models and charging rates of up to 32A
- Developing all the tools required for Distribution Network Operators (DNOs) to manage EV uptake
- Modelling of EV network impacts and constraints
- Monitoring of real-time EV impact to defer reinforcement
- Mitigation of EV impact through Demand Side Response
- V2G test bed development

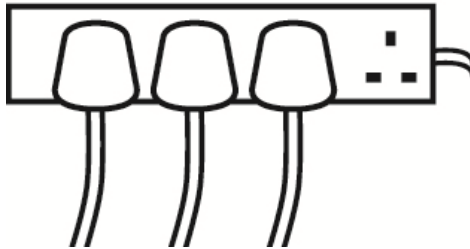


WPD Innovation for Communities

Plugs & Sockets / Cornwall Local Energy Market

Platform for trading
flexibility services

Customers will alter electricity
consumption or generation to benefit
a third party.



DNO, SO, TO, Aggregators, Suppliers, Generators connect
to the “Socket” via “Plugs”

- Notify flexibility services requirements
- Flexibility service trading
- Notify use of flexibility services
- More information at

<https://www.westernpower.co.uk/Connections/Generation/Community-Energy/Articles-and-case-studies.aspx>

centrica

nationalgrid

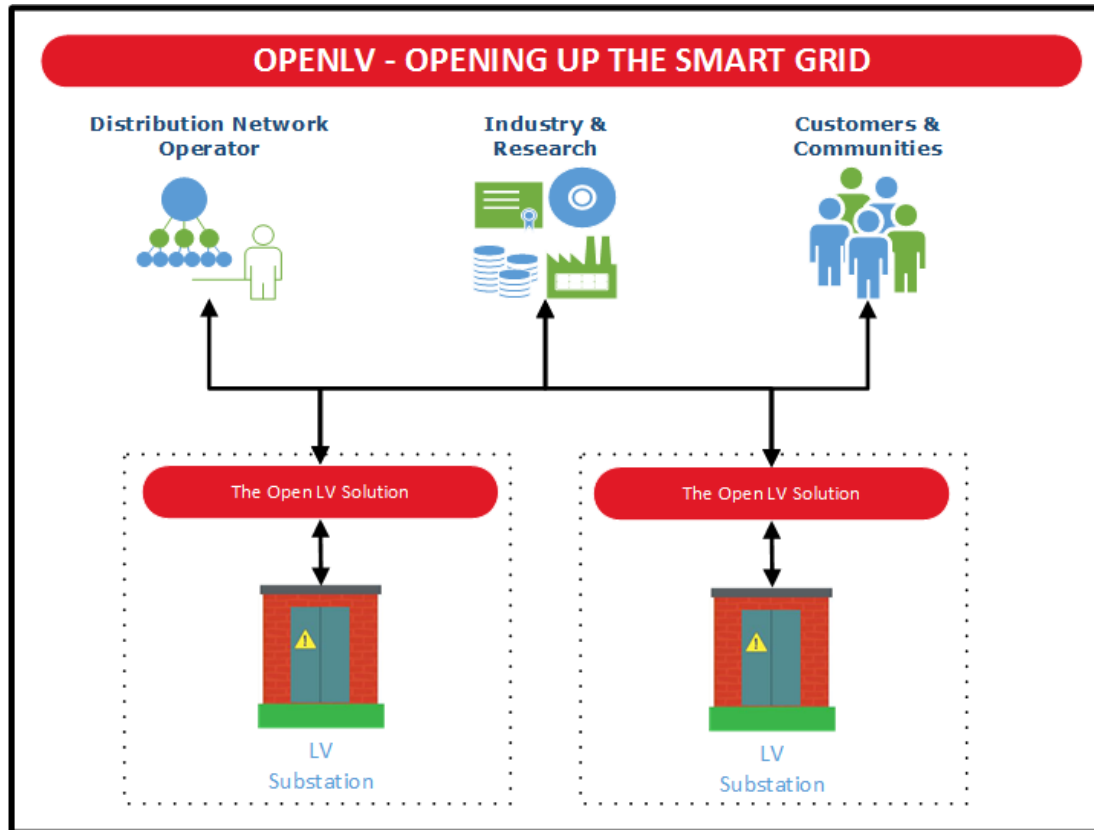
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WPD Innovation for Communities

OpenLV



- OpenLV will deploy a workable open substation platform for both monitoring and control of the LV network.
- This platform will support the usage of a number of apps.

WPD Innovation for Communities

OpenLV



- Through the apps it will provide community energy groups access to LV network data.
- Stimulate the Market to facilitate a common platform with low cost entry for a range of new App developers.

WPD Innovation for Communities

OpenLV



Example Apps:

- What's My Community Demand
- LCT take-up monitoring & prediction
- Real Time Thermal Rating – Transformers and Cables
- DSR for managed EV charging
- Automated Voltage Management
- Distributed generation control
- Community Alerts to request reduction or increase in load
- Automated energy storage control

WPD Innovation for Communities OpenLV



- Submit app proposal by 16 October 2017.
- App development until July 2018.
- <https://openlv.net/about/the-project/for-business-and-academia/>

Summary

- WPD – Traditional role of DNO and the industry changes
- WPD Innovation Team – Areas of focus
- Innovation for Communities
 - Electric Nation
 - Plugs and Sockets
 - OpenLV

Future Events

Electricity Network Innovation events

- London, 1 November:
<https://www.regensw.co.uk/Event/electricity-network-innovation-london>
- Newcastle, 7 November:
<https://www.regensw.co.uk/Event/electricity-network-innovation-newcastle>

Support for Community Energy

Connection Surgeries

- We have an annual schedule of Connection Surgeries
- Our Connection Surgeries allow customers to discuss face-to-face with one of our engineers, either the process of applying for a connection in general or specifics about a particular scheme



Connection surgeries



We operate the regional electricity network and provide new connections to homes, businesses and generation sites at voltages from 230 volts to 132,000 volts.

We understand that ahead of applying to us for a new connection and particularly for Generation Connections, our customers and Independent Connection Providers (ICPs) often have questions and want to understand more about the process, timescales, technical matters, consents/legal requirements and possible constraints of making a connection to the network in a particular area.

With this in mind we are running a series of Connection Surgeries where our engineers will be able to assist you.

The surgeries will run on the dates listed below and enable interested parties (like landowners, ICPs, developers and community groups) to make a 45 minute appointment with an engineer to discuss their requirements and the connection process, ahead of making an actual application for a connection to the network.

QUESTIONS?